SniffMaster I

Installation and Operations Manual

Network General

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Document prepared by David M. Trousdale
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Preface

Preface

The *SniffMaster I™ Installation and Operations Manual* is the basic guide to your SniffMaster I system. Other documents are also useful. You will find them listed in Chapter 1 and referred to throughout this document.

The organization of this manual follows the sequence of steps that a new user would typically follow. It begins with some preliminary information that introduces you to the system. Next, it explains the basic procedures for setting up the system. Finally, it covers some guidelines and tips on running the system.

Chapter 1 provides information on various topics that you may want to review before installing and operating your SniffMaster I system. The chapter covers several possible SniffMaster I system configurations, an explanation of SniffMaster I system operation, a discussion of the variety of uses for a SniffMaster I system, the hardware and software requirements, and a list of documentation you will need to install and to operate your system.

Chapter 2 explains how to install and to configure your SniffMaster I system. The procedures include setting up Sniffer remote analyzers, terminal servers, and the central console.

Chapter 3 covers basic operating procedures for your SniffMaster I system. Topics include starting remote analyzers, setting options from the from the central console, and using the Sniffer features that are unique to the SniffMaster I system.

1. Before You Begin

Chapter 1. Before You Begin

Chapter 1. Before You Begin

Chapter Overview

SniffMaster I is a complete system that enables you to monitor and to analyze problems within distributed local area networks (LANs) from a SniffMaster I central console. Information from multiple network segments observed by Sniffer network analyzers is relayed to the central console in real time. There you can see what is happening anywhere on your network through windows on the central console's screen. Furthermore, you can alter all options on any of the SniffMaster I remote Sniffer analyzers whenever you want. The SniffMaster I system gives you a complete set of tools for monitoring and analyzing your network.

The remote Sniffer analyzers on each network segment are the eyes and the intelligence of the system. Each remote analyzer operates as a station on the LAN and allows you to look into the LAN, to recognize the simplest to the most complex problems, and to locate their sources quickly. The SniffMaster I console serves as an information display mechanism.

The Sniffer family of diagnostic tools helps maintain, trouble-shoot, fine-tune, and expand a network. The two primary features of each network analyzer are seven-layer protocol decoding and traffic monitoring that includes statistical displays, alarms, and report generation.

SniffMaster I Configurations

Figure 1 shows you several possible configurations within a SniffMaster I system. Each remote analyzer sends information to the central console via an analyzer's serial (RS-232) port and through a TCP/IP terminal server.

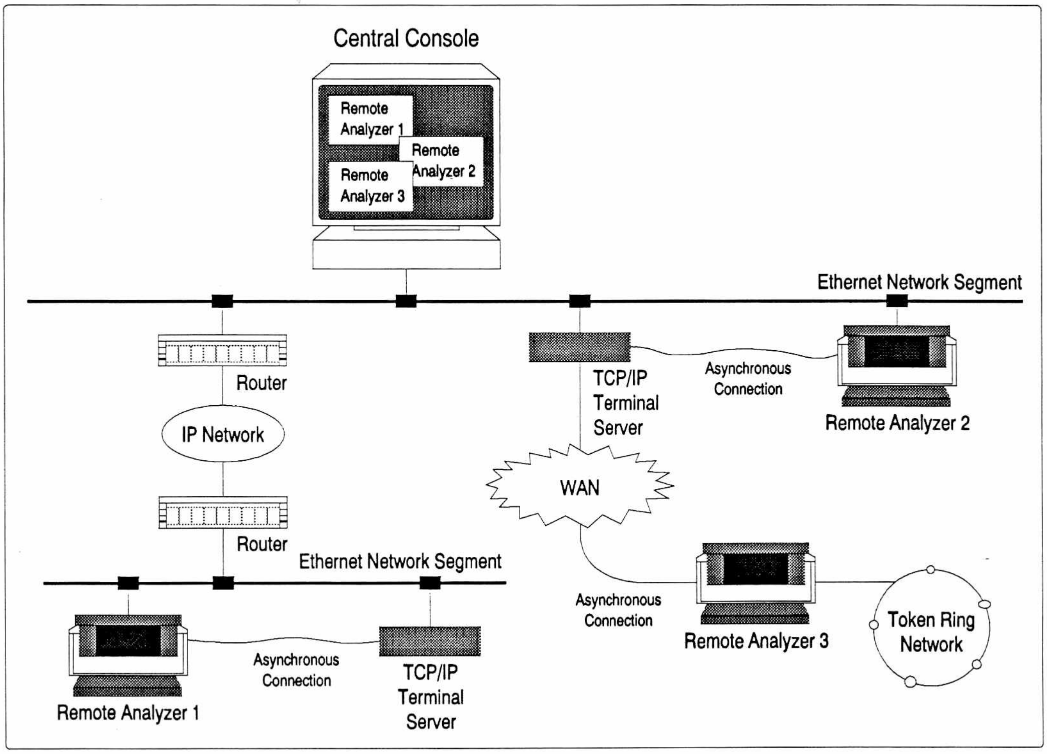


Figure 1. Several possible ways of linking Sniffer analyzers, terminal servers, and a central console to make a SniffMaster I system.

The terminal server associated with *Remote Analyzer 1* connects directly to one Ethernet® segment and to another via an IP router. A MAC layer bridge could also be used. On the other hand, the terminal server associated with *Remote Analyzer 2* is directly connected with a cable to the same Ethernet segment as the central console. *Remote Analyzer 3* shares a terminal server with *Remote Analyzer 2* and is connected via a wide-area network that supports asynchronous communications at 19.2 Kbps.[1]

How SniffMaster I Works

Figure 2 shows how a central console communicates with a remote analyzer. On the central console side, a SunView™ application is running, and on the remote analyzer side, a SniffMaster I terminate-and-stay-resident (TSR) program is running. Both sides use the SNiffer Remote Protocol (SNRP) and TCP/IP to communicate.

---

[1] For the optimal SniffMaster I performance, 19.2 Kbps is recommended. However, connections at other baud rates are also supported.

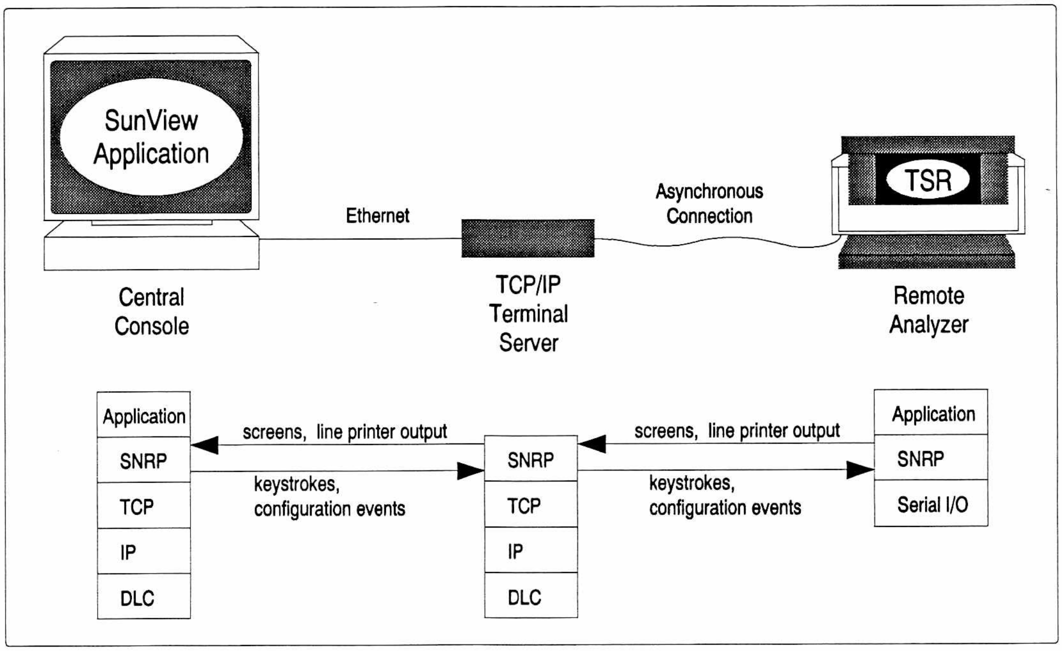


Figure 2. Central console and remote analyzer communication.

SNRP handles such things as sizing Sniffer screens, setting message sizes, setting intervals, transmitting Sniffer screens, and keyboard input and output.

The TSR program in the Sniffer analyzer receives input from the remote analyzer's keyboard and the central console's keyboard. The TSR program also captures output directed to either the remote analyzer's screen or printer port. The captured data is compressed and sent out of the serial port to the terminal server that, in turn, sends the data to the central console.

Using the SniffMaster I System

The SniffMaster I system has a number of specific capabilities you will find useful. One is centralized management of distributed LANs. You can monitor and analyze multiple local and remote LAN segments from a central console (a Sun workstation). This lets you utilize scarce networking expertise more effectively and provides for quicker problem resolution with instant visibility to any LAN segment.

Another capability is simultaneous multi-segment monitoring and analysis. Using multiple windows on the central console, you can gather statistics and analyze network traffic on several LAN segments at the same time.

You can take advantage of the big windows available on the central console with color displays of large amounts of statistical and network information.

Several forms of security are available for the remote Sniffer™ analyzers. Each Sniffer analyzer controlled by the central console can be password-protected to prevent unauthorized use. From the central console, you can also lock and unlock keyboards and screens on remote analyzers to prevent unauthorized users from examining network traffic.

With the SniffMaster I system, you can analyze network data on the central console. You can transfer user-selected network data directly to the central console for printing, display, or storage in files for analysis by additional network management tools.

Finally, you can run the SniffMaster I system concurrently with additional SunNet™ Manager or other Sun applications. The combination of the SniffMaster I system and SunNet Manager provides you with a broad and powerful network management solution.

Hardware and Software Requirements

In order to set up a complete SniffMaster I system, you'll need get some things from Network General Corporation (NGC) and some from other vendors.

- Sniffer analyzer requirements:

  Network General Sniffer Analyzer models 300, 500, or 700

  Sniffer software, Version 3.00 or later

- Terminal server requirements:

  Speed: Up to 19.2 Kbps (preferred)

  Protocols: Support for TCP/IP and raw TCP connection via specified ports

  Serial interface cable

  Products tested: Call NGC for updated list.

- Workstation requirements:

  Models: SPARCstation I
  or Sun 3/80

  Memory: 8 Mbytes or greater

  Operating system: SUN OS 4.03

  Windowing system: SUNView 1.75 or higher

  Networking: Ethernet, TCP/IP

  Display: Monochrome or color

  SniffMaster I workstation software: tar tape from NGC

Documentation

In addition to the manual you're now reading, the following publications will also help you get the most from the SniffMaster I system:

SunView 1 Beginner's Guide

Sniffer Network Analyzer Installation Guide

Sniffer Network Analyzer Operations Manual

Sniffer Advanced Ethernet Network Monitor Users Manual

2. Installation and Configuration

Chapter 2. Installation and Configuration

Chapter 2. Installation and Configuration

Chapter Overview

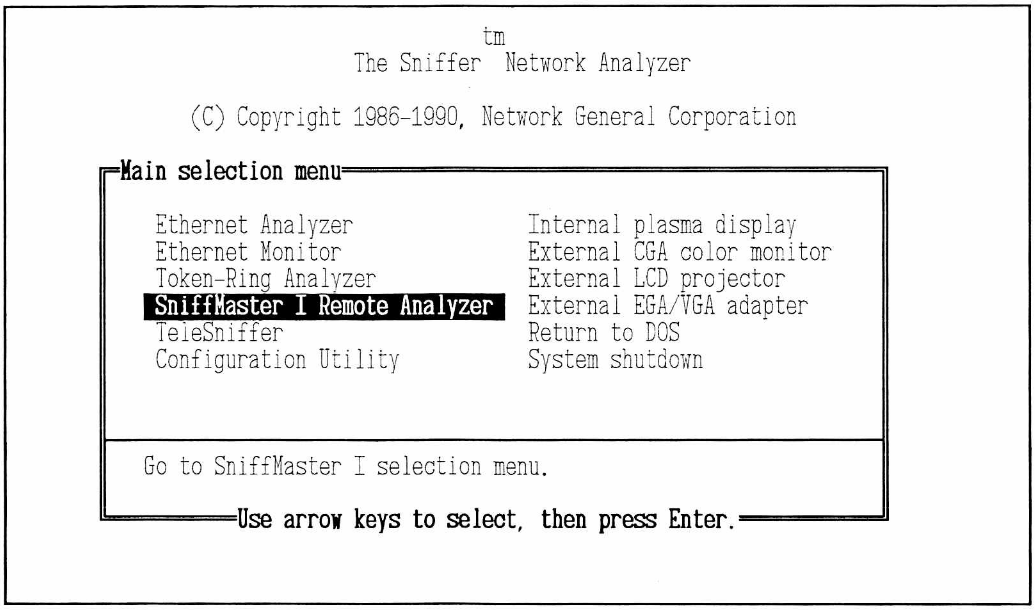
Chapter 2 explains how to install and to configure a SniffMaster I system. The procedures include setting up the three major parts of the system. First, you need to prepare the Sniffer network analyzers to communicate with the central console. Second, you must attach each analyzer to a terminal server via a serial interface cable and then configure the terminal server. Finally, you need to set up the central console.

Setting up a Sniffer Remote Analyzer

The following instructions assume that you've attached each remote Sniffer analyzer to its network segment following your *Sniffer Network Analyzer Installation Guide.* Now you want to set up each SniffMaster I remote analyzer to communicate with terminal servers and, in turn, with the central console.

Configuring SniffMaster I remote analyzer software

The first step is to configure each remote analyzer. Start with the Sniffer **main selection menu.** Figure 3 shows the **main selection menu** that you see after booting an analyzer. The highlight is on the item, **SniffMaster I remote analyzer.** Select the item by pressing **Enter.**



```
                                tm
                     The Sniffer   Network Analyzer

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Main selection menu

    Ethernet Analyzer                    Internal plasma display
    Ethernet Monitor                     External CGA color monitor
    Token-Ring Analyzer                  External LCD projector
    SniffMaster I Remote Analyzer        External EGA/VGA adapter
    TeleSniffer                          Return to DOS
    Configuration Utility                System shutdown

   Go to SniffMaster I selection menu.

              Use arrow keys to select, then press Enter.
```
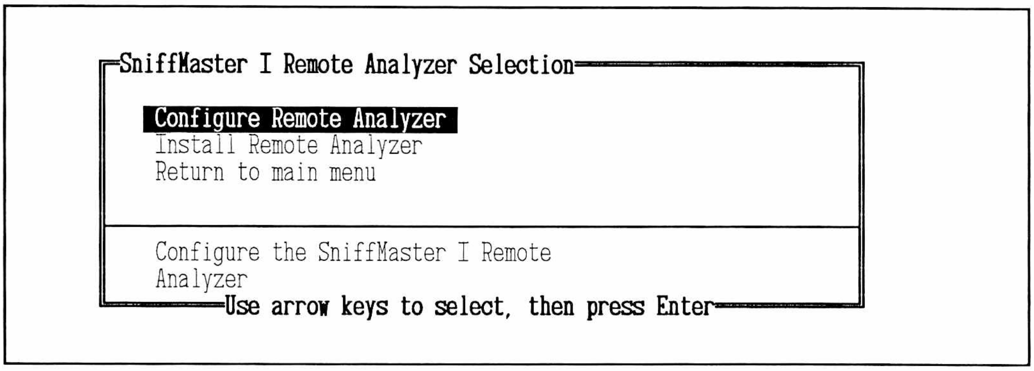

Figure 3. Sniffer main selection menu.

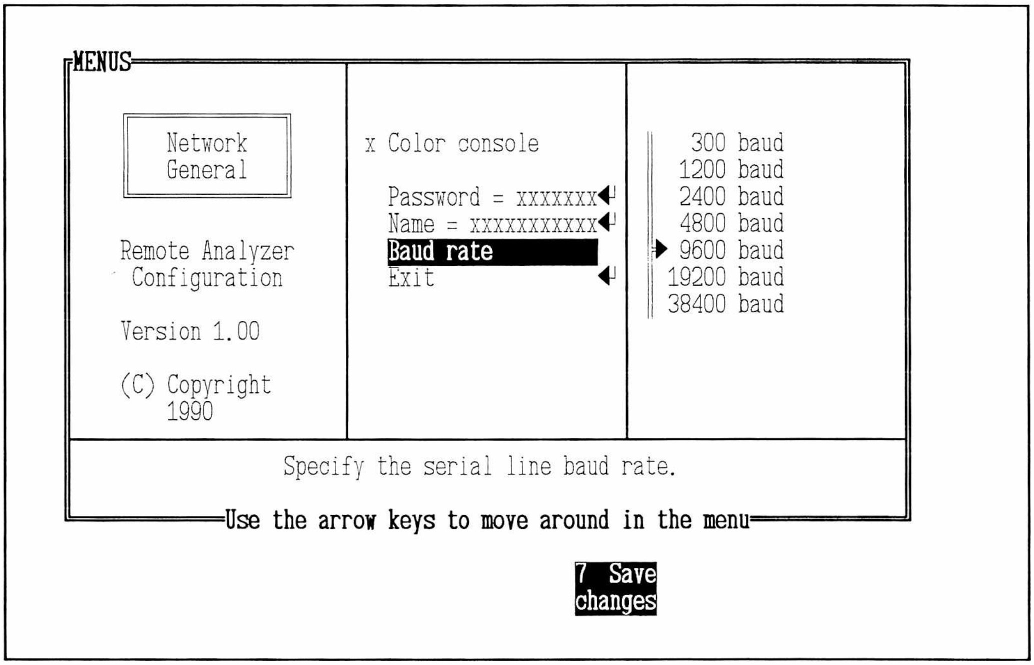
Next you see the **SniffMaster I remote analyzer selection menu** (see Figure 4). The menu lists three items. You will want to configure the remote analyzer first. With the highlight on **configure remote analyzer,** press **Enter.**



```
SniffMaster I Remote Analyzer Selection

  Configure Remote Analyzer
  Install Remote Analyzer
  Return to main menu

  Configure the SniffMaster I Remote
  Analyzer
        Use arrow keys to select, then press Enter
```

Figure 4. SniffMaster I remote analyzer selection menu.

You now see the **remote analyzer configuration menu** (Figure 5 below).



```
MENUS
  Network             x Color console          300 baud
  General                                     1200 baud
                        Password = xxxxxxx↵    2400 baud
                        Name = xxxxxxxxxxx↵    4800 baud
  Remote Analyzer       Baud rate            ▶ 9600 baud
   Configuration        Exit              ↵   19200 baud
                                              38400 baud
  Version 1.00

  (C) Copyright
     1990

              Specify the serial line baud rate.
          Use the arrow keys to move around in the menu

                                        7  Save
                                        changes
```

Figure 5. Remote analyzer configuration menu.

Figure 6 summarizes the four options available on the **remote analyzer configuration menu**. You now need to determine which options are best suited to the requirements of your SniffMaster I system.

Menu Item	Choice	Function
Color console	On Off	Tells the central console that the remote analyzer is using a color console.
Password	31 character limit	Specifies a password that must be entered at the central console. The default is "sniffer."
Name	31 character limit	Specifies a symbolic name that identifies the remote analyzer on the central console's screen.
Baud rate	300 baud 1200 baud 2400 baud 4800 baud 9600 baud 19200 baud 38400 baud	Specifies the serial line baud rate. *(38400 baud not recommended.)*

Figure 6. Options available on the remote analyzer configuration menu.

Color option

Select this option if you intend to run the remote analyzer with a color monitor on the central console. Use the up cursor (↑) to move the highlight up to the menu item, and press the **Spacebar**. A check mark (✓) replaces the x to the left of the item to indicate that you selected the item.

Password option

The **password** option on the **remote console configuration menu** provides one of two forms of security for your SniffMaster I system. The password you specify in the remote analyzer's menu must match the password entered at the central console. (For more on how using this option, see the section, "Editing the .rootmenu file.")

To record the password for this remote analyzer, use the up or down cursor key to move the highlight to the **password** menu item, and press **Enter**. Type in a password with no more than 31 characters, and press **Enter** to accept it.

The second form of security includes disabling the remote analyzer's keyboard and screen from the central console. By this means, you can still see at the central console what the remote analyzer sees, but a person by the remote analyzer will see nothing and cannot tamper with the analyzer through the keyboard. (See the section, "Setting SniffMaster I Options at the Central Console.")

Name option

The **name** option gives you a way to identify clearly each remote analyzer represented on the central console's screen. After installing several remote analyzers to your system, you will see each one through SunView windows on the screen. If you have many windows opened for many remote analyzers, the central console screen will become cluttered. It could be difficult to recognize each remote analyzer quickly without some type of memory aid.

To record a name for a remote analyzer, use the up or down cursor key to move the highlight to the **name** menu item, and press **Enter**. Type in a name with no more than 31 characters, and press **Enter** to accept it.

When you supply a symbolic name with this option, the central console will use it to identify each remote analyzer on its screen. The name will appear in the *window frame header* surrounding the remote analyzer screen and as a label on the *icon* for that remote analyzer (see Figure 19).[1]

Baud rate option

To set the baud rate, press the right cursor key (→) when the highlight is on the baud rate menu item. The menu panel with the seven baud rate choices will move to the center. Use the up and down cursor keys to move the highlight to the one you want, and press **Enter**. The pointer (|▶) in the vertical bar to the left of the choices will move to your preference.

Saving the configuration

To save the configuration, press **F7**. This action will replace the defaults and will remain in effect until you reconfigure the remote analyzer.

Installing SniffMaster I remote analyzer software

The next step is to install the SniffMaster I remote analyzer software. First, you exit the **remote analyzer configuration menu**, You will once again see the **SniffMaster I remote analyzer selection menu** (see Figure 4) and can now install the SniffMaster I TSR program. It runs concurrently with the Sniffer analyzer. Move the highlight with the cursor key to the option, **install remote analyzer**, and press **Enter**.

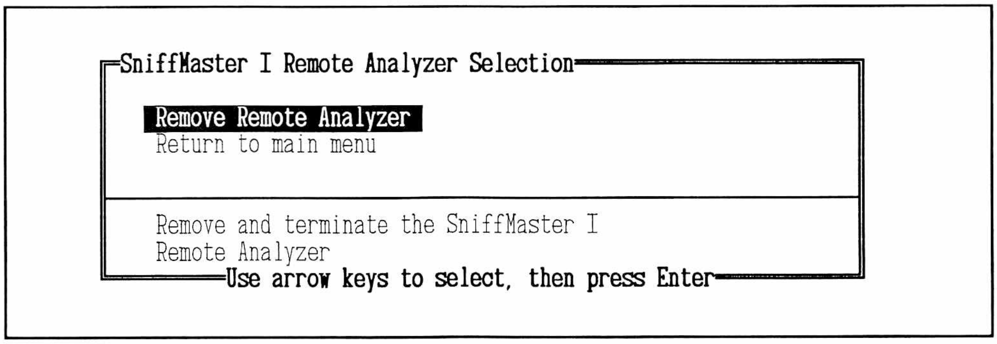
After you install the remote analyzer software, the **main selection menu** will return (see Figure 3). This indicates that you successfully loaded the TSR program.

Unloading the SniffMaster I remote analyzer software

To unload the remote analyzer software, select the **SniffMaster I remote analyzer** item on the **main selection menu** to return to the **SniffMaster I remote analyzer selection menu**. You see a menu like the one show in Figure 7. Select the **remove remote analyzer** item, and press **Enter**.

---

[1] *Window frame header* and *icon* are SunView terminology. See the *SunView Beginner's Guide* for more information.



```
SniffMaster I Remote Analyzer Selection

  Remove Remote Analyzer
  Return to main menu

  Remove and terminate the SniffMaster I
  Remote Analyzer
        Use arrow keys to select, then press Enter
```

Figure 7. SniffMaster I remote analyzer selection menu.

Setting up Terminal Servers

Set up the connection between the remote Sniffer analyzers and their respective terminal servers before going any further.

Any number of available terminal servers may be used in the SniffMaster I system. NGC has tested four that work successfully with the system. Follow the installation instructions in the manual accompanying the terminal server you choose.

You must configure the TTY port of the terminal server to which you attach the remote analyzer. The central console establishes a connection to the terminal server's Internet Protocol (IP) address and the TCP port number of the TTY port. Many terminal servers allow you to specify a network port number that relates to the individual terminal server's RS-232 port. For most RS-232 connections, this port is set at 23 by default, the Telnet server port. But you must set up a direct TCP connection on a port that is not well-known.

NGC recommends that you assign port numbers in the 3000 range. In the IP world, port numbers below 1024 are well-known and should not be used for SniffMaster I purposes.

The terminal server baud rate must agree with the remote console's baud rate that you set in the configuration procedure.

You need the port number and the configuration of each remote analyzer when you set up the central console.

In each section below, you can find example configurations that NGC found to function acceptably.

Interlan NTS200

The Interlan NTS200 is easy to install. Figure 8 shows an example configuration for a TTY port for an Interlan NTS200 terminal server. You need simply to enter the values on the terminal server configuration menu.

Menu Item	**Value**
TTY port	8
Type	slave
Baud rate	19200
Input flow control	XOFF
Output flow control	XOFF
Parity	none
Bits per character	8
Modem control	none
Ring	no
Network port	3208
Password	none
Abort output	none
Interrupt process	none
Inactivity timeout	0
Machine interface	yes

Figure 8. Example configuration for an Interlan NTS200 terminal server.

Hughes LAN Systems 4208

The Hughes LAN Systems 4208 terminal server has 8 serial ports and multiplexes one Ethernet connection into 8 RS-232 connections. The HLS 4208 works well with the default settings. If you have questions about configuring the HLS 4208, refer to the *HLS LINC/Term Multiple Protocol Software for Terminal Servers: Network Manager's Guide to Operations.*

The only thing you need to do is determine the TCP port number that you will need when you configure the central console. First, you look at the number of the serial port that you intend to use. They are numbered 1 to 8. Then you add 7000 to it. Thus, if you have serial port number 3, the TCP port number is 7003.

cisco System ASM

The cisco System ASM terminal server has the ability to manage 40 terminals. You connect through a cable harness of 10 25-pin D-connectors to one telco connector. There are four telco connectors on the back of the ASM unit labeled with the appropriate range of serial port numbers for that connector.

The terminal server comes with a manual entitled *Terminal Server Manual.* It also contains two addenda: "cisco Systems Terminal Server Update" and "Release 7.0 Documentation Update." You will find the set up and configuration for the terminal server described in these documents.

In the majority of cases, SniffMaster I will operate with a pre-installed cisco terminal server. In these cases the server has already been configured for IP addressing. Consult Chapter 4 of the cisco Systems *Terminal Server Manual* for information on unpacking and starting the terminal server.

The procedures and suggestions detailed in this document are solely meant as examples for configuring a cisco System ASM terminal server.

Installation procedures

Establish a connection to the ASM terminal server console port via the RS-232 serial port connector. This is a 25-pin D connector located on the back of the ASM unit in close proximity to the transceiver connector. The port will generally be set at 9600 baud. Attach your terminal (or PC if you are using kermit or another PC terminal emulator), and press the **Enter** key twice. A prompt such as the following should appear:

```
TS>
```

The example below illustrates the configuration of an ASM server used in conjunction with the SniffMaster I system. The prompts and their respective responses are noted on the the left hand side of the page. All characters including and following the ';' character are comments describing the configuration condition.

```
    TS>enable                              ; Gains access to the terminal
                                           ; server commands.

                                           ; At this point, you may want
                                           ; to view the configuration of
                                           ; the terminal server as it
                                           ; exists.
    TS> show configuration
    TS#configure                           ; Enters command collection
                                           ; mode for configuring the
                                           ; system.

Configuring from terminal, memory, or network [terminal]? terminal

Edit with DELETE, CTRL/W, and CTRL/U; end with CTRL/Z; abort with
CTRL/C:

    interface ethernet 0                   ; If IP addressing is required,
                                           ; set up for using
                                           ; subcommands.

    ip address YY.YY.YY.YY ZZ.ZZ.ZZ.ZZ     ; Where YYs = new IP address
                                           ; and ZZs = subnet mask
                                           ; e.g., 255.255.0.0.

For interface Ethernet0, current address XX.XX.XX.XX disagrees with new
address YY.YY.YY.YY using new address.

    line 1 7                               ; Configure serial lines 1 to 7
                                           ; for SniffMaster I.
                                           ; Line numbers will differ by
                                           ; installation.

    no login string
no activation-character
no autobaud                             ; Baud rate will be known
                                        ; from the remote analyzer's
                                        ; SniffMaster I configuration.

no disconnect-character
     databits 8
no escape-character
     no exec
     no hold-character
     no login
     no notify
     no pad
     parity none
     no password
     no rotary
     no session-timeout
     speed 19200                        ; Enter the baud rate
                                        ; corresponding to the remote
                                        ; analyzer's.

stop bits 1
     CTRL/Z
```

You may not want to enter the next step until you have tested this configuration. See the subsection, "Testing the connection."

```
     write memory                       ; Save the configuration.
write
```

Testing the connection

After configuring the terminal server, you will want to test the connection. Attach a remote Sniffer analyzer to a terminal server line that you've configured. (The most common connection is a 9-pin to 25-pin serial cable.) Ensure that the analyzer is configured for SniffMaster I use. Select the **configure remote analyzer** item on the **SniffMaster I remote analyzer selection menu** (Figure 4).

From the SniffMaster I central console, enter a line such as the following:

```
snifftool XX.XX.XX.XX 40pp    ; XX.XX.XX.XX = IP address of configured
                              ; terminal server.
                              ; pp = serial line number to which the Sniffer
                              ; analyzer is attached. (01, 02, xx).
```

The central console should open a remote analyzer window indicating a properly configured system.

The ASM terminal server will treat port numbers of 4000 plus the line number as a raw TCP stream. Hence, terminal server 4 connection will be addressed as port 4004 decimal.

Configuring the central console

Once you've tested and saved your terminal server configuration, you'll need to configure the central console. When you get to that phase of installing the SniffMaster I system, be sure to add the line, `ka 90`, to the central console's `/etc/rsniff.config` file.

3Com Series 200-TCP

The 3Com Series/210 terminal server has 10 RS-232 ports on the back marked J0C–J9C. An Ethernet transceiver connector is also located on the rear panel of the unit. The terminal server examined by NGC had a floppy disk labeled:

PART NO.	83-0102-04
SERIAL NO.	XXX
PRODUCT	CS/210
TYPE	SW/200-TCP
VERSION NO.	3.2

Following are the installation steps worked out by NGC:

Starting the monitor program

Most terminal servers to be used in the SniffMaster I system are pre-existing servers used for existing terminal/printer devices. To add a SniffMaster I central console connection, you must reconfigure the terminal server through the *monitor console.*

The monitor console is the connection marked J0C. In some cases, connecting a terminal to J0C and resetting the terminal server will result in the monitor being active on that port. However, in other cases, the monitor needs to be enabled by resetting the unit using the reset button recessed in the lower left side of the unit, connecting a terminal to J0C, and depressing the terminal's **C/R-Enter** key.

A message such as the following will appear:

```
Bridge Communication Series/210 Monitor
>
```

Booting the config utility

Insert the boot floppy in the terminal server, and enter the command

```
bt 1d
```

at the monitor prompt to boot from the floppy disk.

The screen will clear, and the following menu will appear:

```
-----------------------------------------------------------
                Sysgen Utility V2.0
     1. View/Alter Module Parameters
     2. Save Parameters
     3. Exit to Monitor
     Enter Selection:
-----------------------------------------------------------
```

Enter a 1 to configure the terminal server for the SniffMaster I system. Next you will see the following menu:

```
-----------------------------------------------------------
                Module Select Menu
     1. Kernel Parameters
     2. Data Link Parameters
     3. IP Parameters
     4. TCP Parameters
     5. User Interface Parameters
     6. Virtual Terminal Parameters
     7. Statistics Monitoring Parameters
     8. Service Listener Port List
     9. Access Control Parameters
     A. Remote Access Parameters
     (Esc to return to main menu)
     Select module:
-----------------------------------------------------------
```

If your terminal server is already connected and has an IP address, skip to the step, "Adding a service listener port."

To set up a simple demonstration connection from a non-configured system, continue with the next step, "Establishing an IP address."

Refer to 3Com's *TCP/IP Connection Service User's Guide* for a permanent connection and further instructions.

Establishing an IP address

To establish an IP addressAfter you enter a 3 at the **module select menu**. You will see the following menu:

```
-----------------------------------------------------------
                IP Parameters
        Parameter                       Current Value
     1. Network to IP mailbox           0x20
     2. Client to IP mailbox            0xC
     3. Server Internet Address         0#.0#.0#.0#
     4. Server Subnet mask              not a subnet
     5. IP Option Handling Parameter
     (Esc to return to main menu)
     Select module:
-----------------------------------------------------------
```

Enter a 3 at the **IP Parameters menu**.

The next message is:

```
Enter Server address (x.x.x.x):
```

Enter the address desired for this terminal server.

The next message is:

```
Enter subnet mask -- X to clear(none):
```

Enter a mask, or press **C/R-Enter** key to continue.

After the address is set, press **Esc** to return to **module select menu.**

Adding a service listener port

The SniffMaster I central console communicates with the remote analyzer via one of the RS-232 ports on the terminal server. Each port must be assigned its own IP address and port number. This assignment keeps the terminal server from rejecting the non-Telnet TCP port connection requests. The central console TCP port is user-selectable and not a well-known number. NGC uses the port address 3208 as a default TCP port number for TCP connections.

You will set the IP address for the port as part of the procedure for exiting the monitor described in the next section.

To add the central console port number, enter 8, **service listener port list**, on the **module select menu**. You'll see the following menu:

```
-----------------------------------------------------------
           Service Listener Well Known Ports
     1.    23(  17)
     2.   513( 201)
     3.   (Add new Service here)
     (Esc to return to main menu)
     Select module:
-----------------------------------------------------------
```

Enter 3 to select the item, **add new service here**.

The next message is

```
Enter well-known port number (or 0 to clear)
```

To use the default SniffMaster I central console port, enter 3208. Otherwise, enter the port number of your choice , and use it in the next step.

Exiting the monitor

After the port number is selected, depress the **Esc** key twice to return to the **Sysgen utility menu**. Then enter a 2 to **save parameters**. The question, **are you sure?**, will appear. Enter a "y" for *yes*. The message, **saving new configuration,** will appear momentarily. Enter a "3" to **exit the monitor.** The prompt should now appear.

Reset your terminal server using the reset switch on the terminal server's front panel.

Switch the terminal connector to its original connection. In our example, we use the J1C connector.

After the system has reset, use the following key sequence:

C/R -Enter . C/R-Enter

Now you should see the following message:

```
Welcome to your Comm Server
CS/210T>
```

Change to **global network manager** privilege level by entering:

```
set priv=gnm
```

Pick the RS-232 port for SniffMaster I use. Our example uses port 4. Set the port to be used as a host port, the baud rate, the IP address of the port to the one you require, **flowcontrol** in only one direction (**accept XON/XOFF**) by using the following command and accompanying arguments:

```
setd (!4) dv=host ba=19.2 ip=XX.XX.XX.XX FCT=none
```

Testing the configuration

Attach a Sniffer remote analyzer serial port to a terminal server line that has been configured through the above steps. (The most common connection is a 9-pin to 25-pin serial cable.)

Ensure that the Sniffer remote analyzer is configured for SniffMaster I use. (Select the **configure remote analyzer** item on the **SniffMaster I remote analyzer selection menu** (see Figure 4.)

From the SniffMaster I console, enter a line such as the following

```
snifftool XX.XX.XX.XX 3208
```

In the example above, XX.XX.XX.XX is the IP address of configured serial port for a SniffMaster I connection and 3208 is its port number.

The SniffMaster central console should open a remote analyzer window indicating a properly configured system.

Setting up a Central Console

The following instructions assume that you've attached a Sun workstation to its network segment. Now you want to set it up as a SniffMaster I central console to communicate with terminal servers and, in turn, with all the remote Sniffer analyzers.

Loading SniffMaster I software requires *root privileges* on the Sun workstation. Obtain this privilege before continuing.

Logging on

Because the UNIX operating system running on the Sun workstation can be used by many people at the same time, it must be able to differentiate between you and other users. You must identify yourself before the UNIX system will process your requests.

The first thing you should see is the **login** prompt of the Sun workstation. At the prompt, type

```
root
```

and press **Return**. Next you will be prompted for a password. Type the root password, and press **Return**.

At this point, you will see a message and a prompt when you successfully log on. The message is called the "message of the day."

Loading SniffMaster I central console software

Your SniffMaster I central console software comes on a tape. To begin loading it to your Sun workstation, type the "change directory" command

```
cd /
```

and press **Return**.

Next put the tape into the appropriate drive. Type

```
tar xvf /dev/rst0
```

and press **Return**. This command will create the `sniffmaster` directory that contains the text and binary files need to run `snifftool`. The placement of binary and configuration text files in the `sniffmaster` subdirectory allows for advanced custom installations using the `RSNIFF` environment variable and the entries in the configuration file.

After the `tar` command has completed its operation, perform the following steps:

```
cd /sniffmaster

cp etc/*  /etc
```

For the next command, use `sun3` if you are using a Sun 3 system. Use `sun4` if you are using a SPARCstation.

```
cp [sun3 | sun4]/bin/snifftool  /bin/snifftool
```

You've now installed the SniffMaster I central console software.

Bringing up SunView

The next step is to set some basic options at the central console. If you haven't already, you must first bring up SunView, a window-based environment that lets you run SunOS tools. Each tool has its own SunView "window" or "frame."

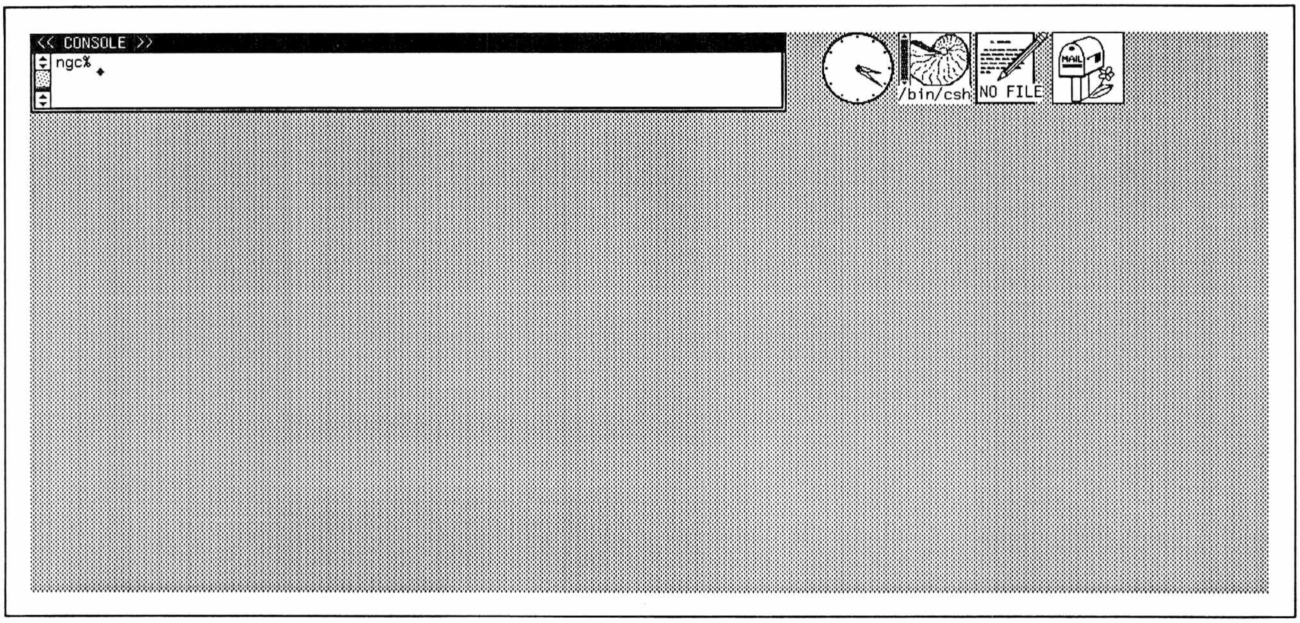
SunView lets you see several directories or files, or run several commands, at the same time.

At the prompt, type

```
sunview
```

and press **Return**.

Now you are in the SunView environment. Figure 9 shows you a typical SunView screen. You can see the parts of a SunView screen that you will use when running the SniffMaster I system from the central console. For detailed information about the SunView screen, see *SunView I Beginner's Guide.*



```
ngc%
```

Figure 9. SunView screen showing significant parts: console frame, icons, root area, and so on.

The grey background in the figure is known as the **root area** of the SunView interface. In the upper left-hand corner of the figure is the **console frame** (see the next section). The four items just to the right of the console frame are **icons**.

The console frame

It is always a good idea to leave on the screen the **console frame** that opens upon startup. The console frame displays messages from SunView and Sun OS. For example, if you have network problems, it traps error messages from the system that may disrupt your screen and Sniffer sessions.

Sometimes you or someone else may close or quit the console frame. If you close it, the console frame will be represented as an icon on the screen (see Figure 10 below).

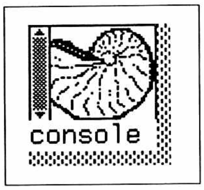


Figure 10. SunView console frame icon.

To reopen the console frame, place the mouse pointer on the console frame icon, and click the left mouse button.

If for some reason you quit the console frame, put the mouse pointer anywhere in the root area, and hold down right button. When the **root menu** appears, keep pressing the right mouse button while you pull the pointer down to the menu item, **shells**. Keeping the right mouse button down, pull the pointer to the right until you see the shells submenu with the **console** item (see Figure 11). While the pointer is over the console menu item, lift up on the mouse button. A console frame will appear.

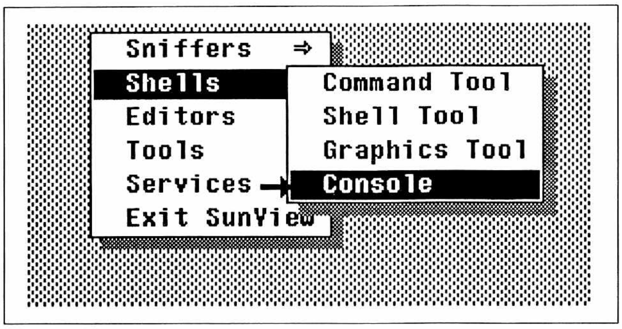


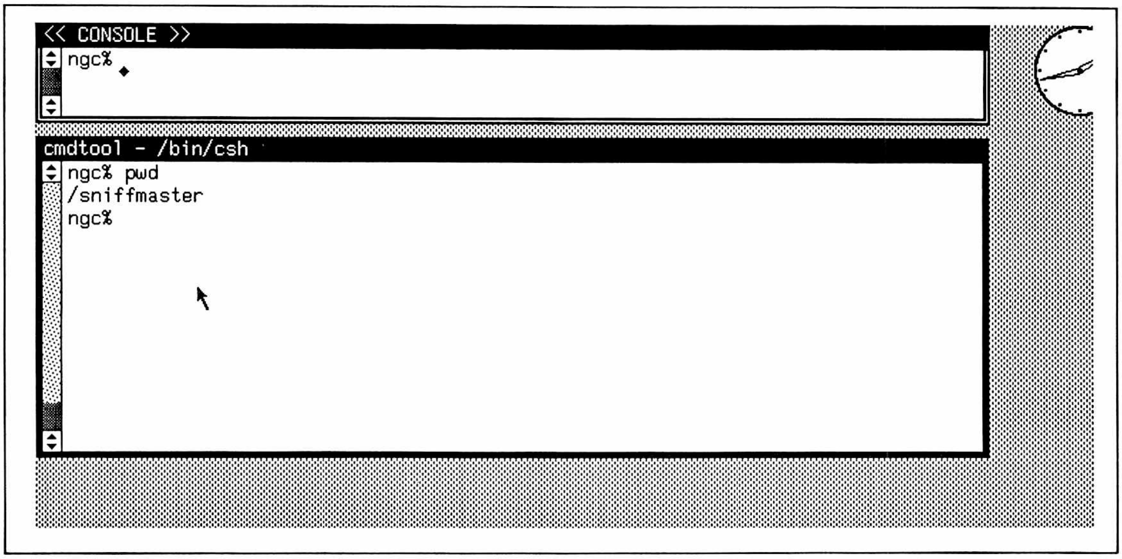
Figure 11. The root menu and the shells submenu.

Place the console frame at the top of the screen and out of the way as you see in Figure 9. You move and resize the frame using the **frame menu** (see Figure 17). See the *SunView I Beginner's Guide* for directions on moving and resizing.

Checking, changing, and examining directories

Before going any further, it may be valuable to check to make certain which directory you are in and to change directories if necessary. Also you may want to read the latest information on the SniffMaster I system in the README file.

To check the directory, you first open a **command tool frame** by putting the pointer in the root area and holding down the right button. While you still hold the right mouse button down, move the mouse pointer down to the menu item, **shells**, and then pull it right to the menu item, **command tool** (see Figure 11).



```
ngc%
```

```
ngc% pwd
/sniffmaster
ngc%
```

Figure 12. SunView command tool frame.

Now lift up the right mouse button, and a command tool frame appears (see Figure 12). To check what directory you are in. Type

```
pwd
```

and press **Return**. The central console should say

```
/sniffmaster
```

If you are in some other directory, change directories by typing

```
cd /sniffmaster
```

and pressing **Return**.

To examine directory contents, type

```
ls -la
```

and press **Return**.

Figure 13 lists the SniffMaster I directories and files at the central console:

Directory	File	Purpose
`/sniffmaster`	`README`	A note containing up-to-date information about the SniffMaster I system.
	`.rootmenu.example`	A sample rootmenu configuration file. This gives you an idea about how to set up the real .rootmenu file.
`/bin`	`snifftool`	The SunView application that runs on the central console.
`/etc`	`rsniff.config`	A sample snifftools configuration file.
	`font.big`	Large type font.
	`font.small`	Small type font.
	`font.very.small`	Very small type font.

Figure 13. SniffMaster I directories and files at the central console.

The README file you see listed in the directory contains additional and up-to-date documentation. To read the README file, type

```
more README
```

at the prompt, and press **Return.**

Editing the .rootmenu file

You use the root menu to add SunView windows displaying remote analyzers to the central console monitor. The next step is to add menu items to the root menu. This will then let you invoke SunView frames containing views of the remote analyzers on your system. Figure 14 shows an example of how remote analyzers will be listed on a submenu of the root menu.

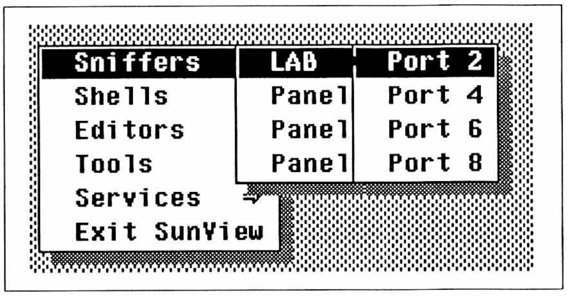


Figure 14. The Sniffers menu and the LAB submenu listing four analyzers: Port2, Port4, Port6, and Port8.

To do the editing, open a **command tool frame** by first putting the pointer in the root area and holding down the right button. While you still hold the right mouse button down, move the mouse pointer down to the menu item, **shells,** and then pull it right to the menu item, **command tool** (see Figure 12).

Now lift up the right mouse button, and a command tool frame appears. Check to see what directory you are in. The `.rootmenu` file will be in either the `$HOME` directory or the `/usr/lib` directory.

To edit the .rootmenu file, type

```
vi .rootmenu
```

at the prompt, and press **Return**. Now you should see an editable version of the .rootmenu file. You can now use the Unix visual-interactive editor to configure the root menu.

```
"Sniffers"          MENU
          "LAB"               MENU
                    "Port2"             snifftool 118.18.4.9 9298
                    "Port4"             snifftool ts 3207
                    "Port6"             snifftool ts 3206    -password sesame
                    "Port8"             snifftool /dev/ttya  -baud 9600
          "LAB"               END
"Sniffers"          END
```

Figure 15. An editable .rootmenu file and a configured root menu.

Basically, what you must do is add items to the root menu that will let you regularly start up remote analyzers and display their screens on the central console's monitor. Figure 15 shows an example of a configured root menu. Figure 14 shows the result of the edits.

In the example, the first-level menu was named **Sniffers** on the first and last lines. Enclose the menu item name in quotes. Follow the first instance of the name with **MENU** (use all upper case), and follow the second instance of the menu name with **END**.

The submenu was named **LAB**. The format of submenu names is the same as for menu names. Remote analyzers grouped in this way on submenus can represent logical or functional distinctions that are important to your system.

The four menu items on the LAB submenu—`Port2`, `Port4`, and so on—represent the four middle lines in the .rootmenu file. They are names for four different remote analyzers. Following each name in the .rootmenu file, you see the command followed by several different kinds of argument that takes the following general format:

```
snifftool [IP address | /device] [port number] -password [passwordname] -baud [rate]
```

Always begin with the command, `snifftool`. The arguments that follow can vary:

`[IP address | /device]` The complete IP address or device name of the terminal server. If you've attached the remote analyzer to a port on the central console, then use the IP address of the central console. You can also substitute an *alias*. As you can see in Figure 15, the terminal server for the remote analyzer, `Port2`, has an IP address of `118.18.4.9`. `Port4` and `Port6` have the alias, `ts`. `Port8` has the alias, `sm`.

If you use a device name, provide the absolute path name to the device starting at the root and with a slash, `/`. Figure 15 shows the absolute path name as `/dev/ttya`.

`[port number]`	The port number of the terminal server or central console to which you attached the remote analyzer. Figure 15 shows a port number of 9298 for the terminal server connecting `Port2`.
`-password [passwordname]`	The remote analyzer's password. In Figure 15, look at the entry for the terminal server connecting `Port6`. The third argument in that line, `-password`, automatically enters the password, `sesame`. If you don't want the password entered automatically, don't use this argument. If the remote analyzer was set up with a password, you'll be prompted for that password upon selecting a remote analyzer from the root menu. If the remote analyzer was not set up with a password, the connection will occur automatically.
`-baud [rate]`	Baud rate when connecting to a port on the central console. When you want to connect the remote analyzer to a port on the central console, use `-baud`. `Port8` in Figure 15 has the baud rate set to 9600.

3. Operation of the SniffMaster I System

Chapter 3. Operation of the SniffMaster I System

Chapter 3. Operation of the SniffMaster I System

Chapter Overview

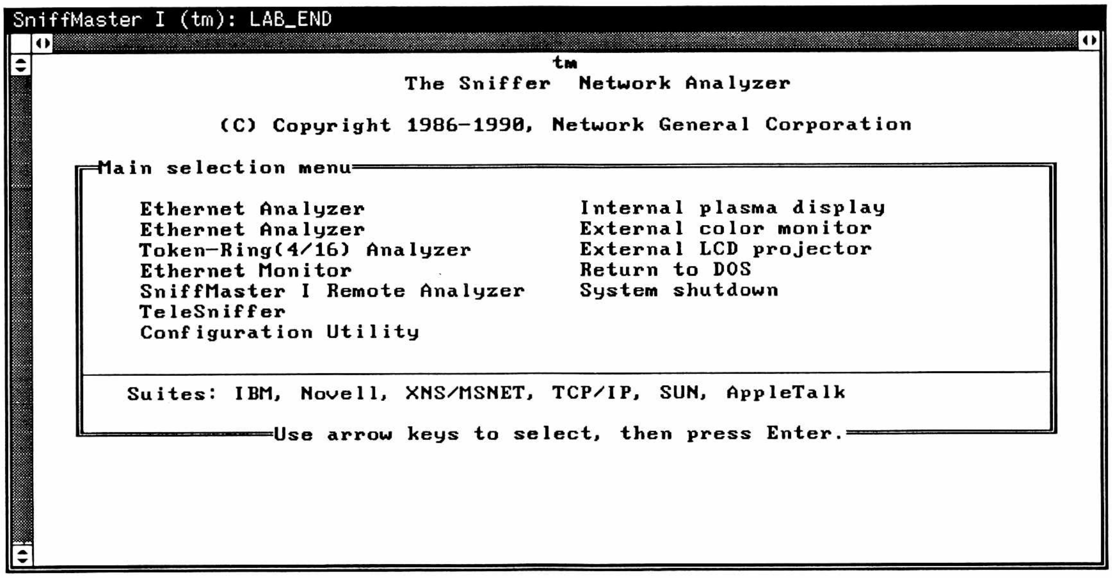
Chapter 3 describes how to operate the SniffMaster I system. There is not much more to its operation. First you open windows (also known as "frames" in the SunView system) on the central console with views of remote analyzers. Then set your preferences for each frame from its options menu.

From then on, you run each remote unit just like you would a Sniffer analyzer. There are a few differences, however. Because of the SniffMaster I system, several enhancements to the Sniffer analyzer itself make it an even more useful and easy-to-use tool for network analysis, monitoring, and troubleshooting.

Starting Remote Analyzers at the Central Console

To start a remote analyzer, place the pointer in the root area, and hold the right mouse button down. When you see the root menu, pull the pointer down until it points to the **Sniffers** item. Keeping the mouse button down, pull right until you come to a submenu containing the list of remote analyzers you want. Pull the pointer down to the remote analyzer on the list that you want, and lift up on the mouse button.

After the frame opens, you see the Sniffer analyzer **main selection menu** visible in Figure 16. To start one of the Sniffers listed on the menu, use a cursor key to select desired Sniffer, and press **Return**.

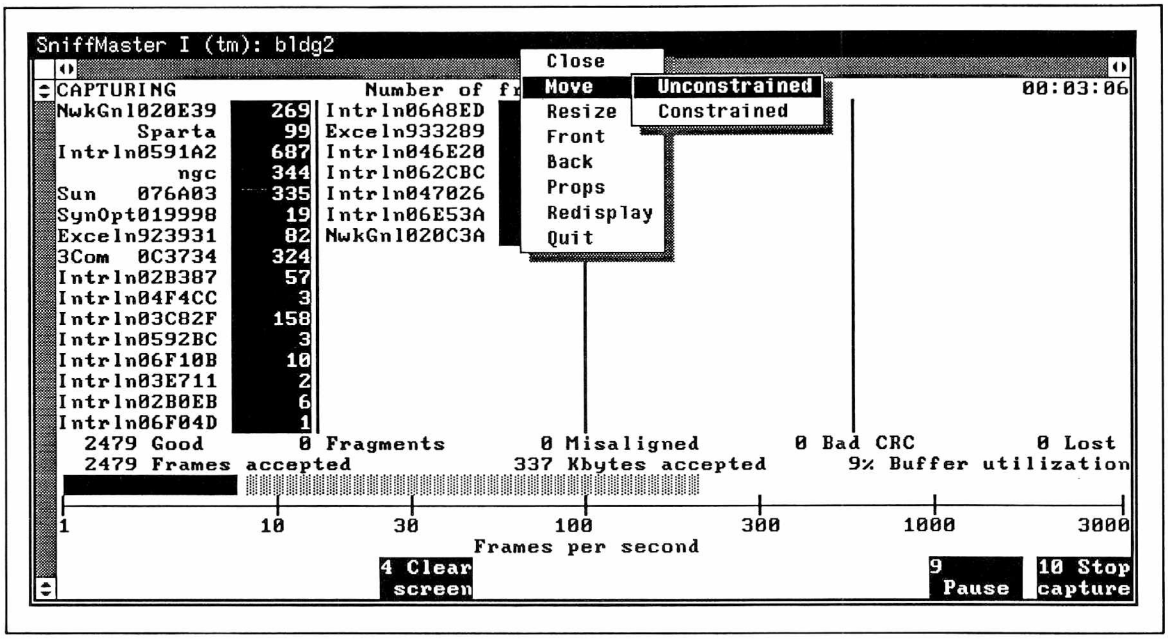


```
SniffMaster I (tm): LAB_END

                              tm
                    The Sniffer  Network Analyzer

          (C) Copyright 1986-1990, Network General Corporation

 Main selection menu

      Ethernet Analyzer                    Internal plasma display
      Ethernet Analyzer                    External color monitor
      Token-Ring(4/16) Analyzer            External LCD projector
      Ethernet Monitor                     Return to DOS
      SniffMaster I Remote Analyzer        System shutdown
      TeleSniffer
      Configuration Utility

     Suites: IBM, Novell, XNS/MSNET, TCP/IP, SUN, AppleTalk
                 Use arrow keys to select, then press Enter.
```

Figure 16. SunView window frame with Sniffer screen showing main selection menu.

To use the keyboard to run the analyzer or to set options for that frame, move the arrow cursor into the SunView frame. The frame border will turn from a double line to a thick solid line. The frame is now active.

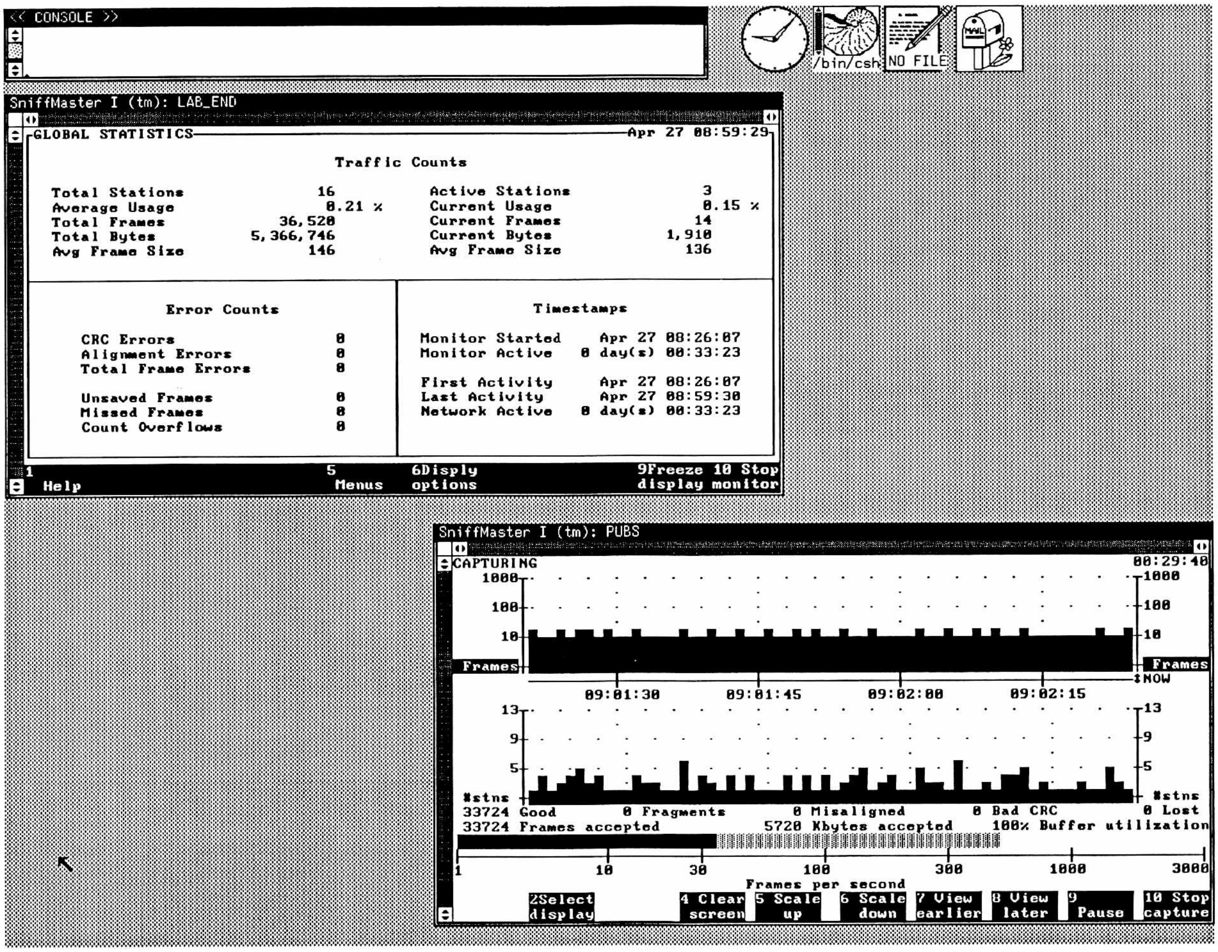
When you open several analyzers, use the options in the frame menu to arrange your monitoring and analyzing tools on the screen. Figure 17 below shows the frame menu that you pull down by position the arrow cursor on the frame header, holding down the right mouse button, and lifting the button up on the item of your choice.



```
SniffMaster I (tm): bldg2
CAPTURING                   Number of fr                                      00:03:06
NwkGn1020E39    269  Intrln06A8ED
     Sparta      99  Exceln933289
Intrln0591A2    687  Intrln046E20
         ngc    344  Intrln062CBC
Sun   076A03    335  Intrln047026
SynOpt019998     19  Intrln06E53A
Exceln923931     82  NwkGn1020C3A
3Com  0C3734    324
Intrln02B387     57
Intrln04F4CC      3
Intrln03C82F    158
Intrln0592BC      3
Intrln06F10B     10
Intrln03E711      2
Intrln02B0EB      6
Intrln06F04D      1
  2479 Good          0 Fragments         0 Misaligned         0 Bad CRC          0 Lost
  2479 Frames accepted               337 Kbytes accepted      9% Buffer utilization
```

Figure 17. SunView frame menu listing options.

Repeat each of the steps above for each analyzer with which you want to work.



```
SniffMaster I (tm): LAB_END
GLOBAL STATISTICS                                          Apr 27 08:59:29

                            Traffic Counts

  Total Stations           16         Active Stations           3
  Average Usage            0.21 %     Current Usage             0.15 %
  Total Frames         36,520         Current Frames           14
  Total Bytes       5,366,746         Current Bytes         1,910
  Avg Frame Size          146         Avg Frame Size          136

           Error Counts                          Timestamps

    CRC Errors                  0     Monitor Started      Apr 27 08:26:07
    Alignment Errors            0     Monitor Active   0 day(s) 00:33:23
    Total Frame Errors          0
                                      First Activity       Apr 27 08:26:07
    Unsaved Frames              0     Last Activity        Apr 27 08:59:30
    Missed Frames               0     Network Active   0 day(s) 00:33:23
    Count Overflows             0
```

```
SniffMaster I (tm): PUBS
CAPTURING                                                         00:29:40
33724 Good        0 Fragments       0 Misaligned      0 Bad CRC      0 Lost
33724 Frames accepted          5720 Kbytes accepted   100% Buffer utilization
```

Figure 18. SunView with Sniffer screens showing advanced network monitoring and a capture display.

Figure 18 shows a Sniffer analyzer and a monitor displayed on the central console.

When you use the frame header menu to close the frame, you'll see an icon like the one shown in Figure 19. Selecting the icon and holding down the right mouse key will open a menu like you see in the figure. The menu has a listing of options similar to that in Figure 17. You can use the menu to open the frame again or to quit the remote analyzer altogether.

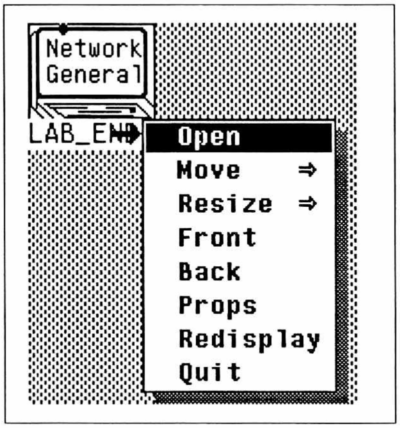


Figure 19. A Sniffer icon.

Setting SniffMaster I Options at the Central Console

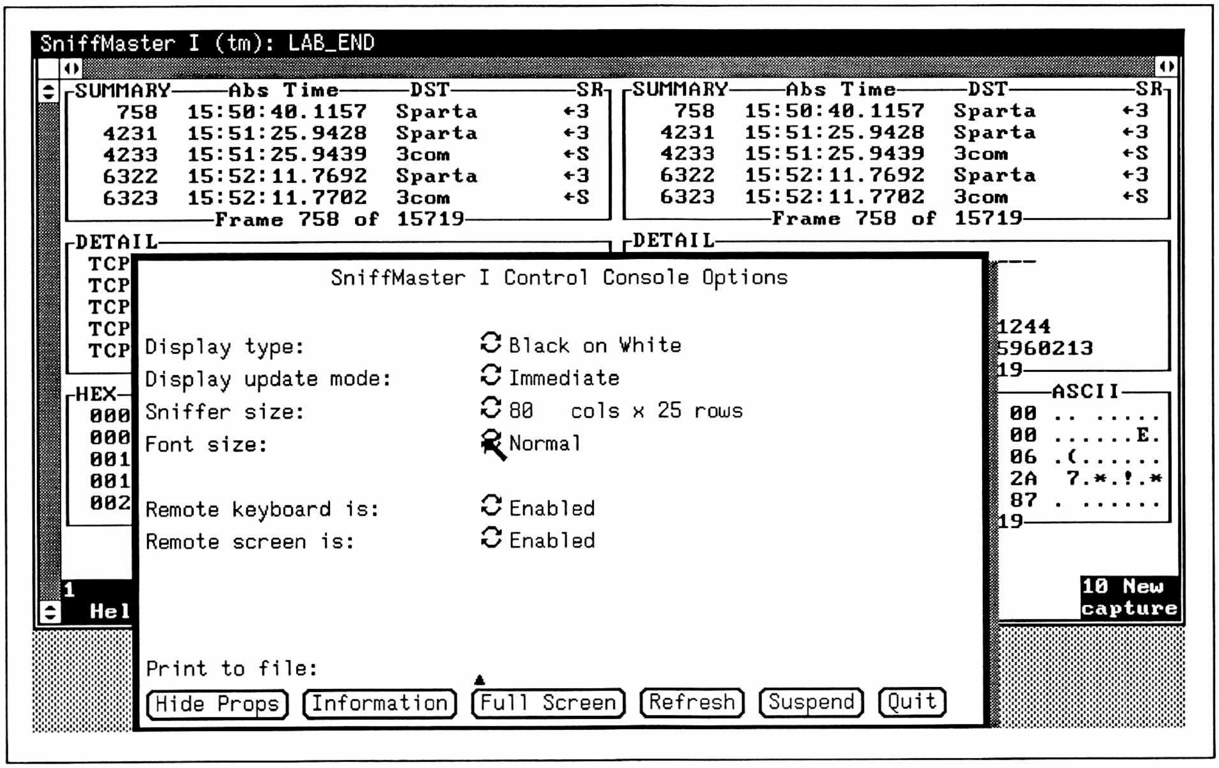
At the central console, you can set a number of SniffMaster I options that affect both the central console and the remote analyzer.

SniffMaster I central console options menu

There is one central console options menu for each Sniffer analyzer you have running. To open the central console options menu for a particular Sniffer, first move the arrow cursor so that it is within the frame containing the view of the Sniffer you want to work with. You open the central console options menu for that particular Sniffer in one of two ways:

props key You will find the props key among the function keys on the left-hand side of the keyboard. Upon pressing the key, you see the central console options menu.

frame menu One item on the frame header menu (see Figure 17) is **props.** To get the menu, move the pointer over the frame header of the frame showing the Sniffer session you want to alter. Hold down the right mouse button. While holding the right mouse button down, pull the pointer down the frame menu until you reach the props item, and then lift up on the button. The central console options menu will open.



```
SniffMaster I (tm): LAB_END
SUMMARY——Abs Time——————DST————————SR
   758  15:50:40.1157  Sparta       ←3
  4231  15:51:25.9428  Sparta       ←3
  4233  15:51:25.9439  3com         ←S
  6322  15:52:11.7692  Sparta       ←3
  6323  15:52:11.7702  3com         ←S
        ————Frame 758 of 15719————
```

```
SniffMaster I Control Console Options

Display type:            Black on White
Display update mode:     Immediate
Sniffer size:            80   cols x 25 rows
Font size:               Normal

Remote keyboard is:      Enabled
Remote screen is:        Enabled

Print to file:
```

Figure 20. SunView with a SniffMaster I central console options menu.

The central console options menu (see Figure 20) offers three methods for entering choices:

- Clicking a cycle item.
- Clicking a panel button.
- Typing in directory and file names.

Clicking a cycle item

One method is the **cycle item** which looks like two arrows going around in a circle and follows a menu item.

⟳

A cycle item lets you "cycle" through a set of choices until you come to your preferred choice. You do that by placing the pointer on the cycle item and by clicking it with the left mouse button. The complete set of choices for each item is visible in a pull-right menu.

To view the list of choices and to make a choice from the list, place the pointer on the cycle item, and hold down the right mouse button. When the menu appears, keep the mouse button down, pull the pointer down to your choice, and lift up on the mouse button.

Figure 21 below lists each menu item on the central console options menu, the choices selectable by a cycle item, and the purpose of the choice.

Menu Item	**Choice**	**Purpose**
Display type	Color	Updates both background and foreground color attributes. Slow screen refresh.
	Fast color	Updates only foreground color attributes. Faster screen refresh.
	Black on white	Black characters on white background.
	White on black	White characters on black background.
Display update mode	Immediate	Preferred; however, some characters get overwritten.
	Full screen	Faster screen update, but because it uses more memory, can slow down other applications.
Remote Sniffer analyzer screen size NOTE: To see the result, go back to the main menu before displaying the data.	80 columns x 25 rows	Small screen size; default size.
	100 columns x 40 rows	Middle screen size.
	120 columns x 60 rows	Large screen size.
Font size	Tiny	16 characters per inch.
	Small	12 characters per inch.
	Normal	11 characters per inch.
	Large	7 characters per inch.
Remote keyboard is	Enabled	Remote analyzer will recognize keystrokes from its own keyboard.
	Disabled	Remote analyzer will *not* recognize keystrokes from its own keyboard.
Remote screen is	Enabled	Remote analyzer screen display is visible.
	Disabled	Remote analyzer screen display is *not* visible.

Figure 21. Choices available on the SniffMaster I central console options menu.

Clicking a panel button

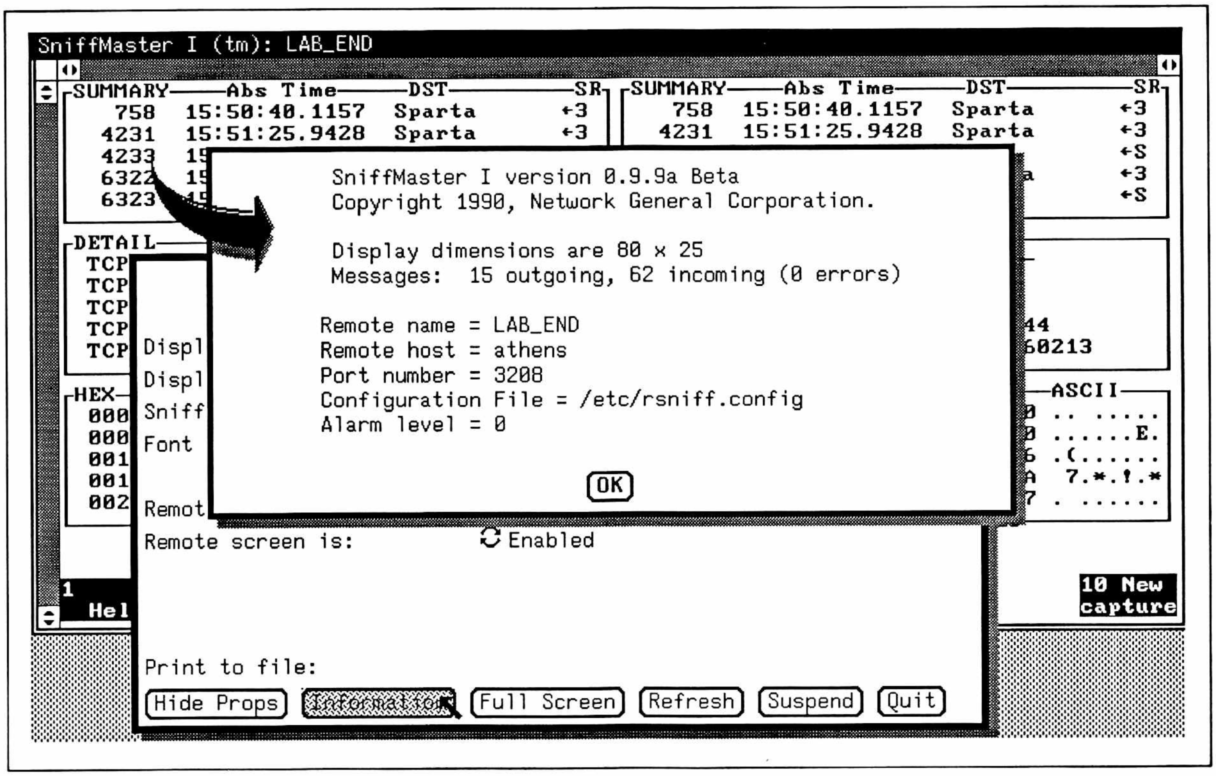
The second method for making a choice on the central console options menu is the **panel button**. There are six labeled panel buttons at the bottom of the central console options menu. The six panel buttons are visible on Figure 20 and described in Figure 22.

Panel Button	Purpose
Hide props	Closes the central console options menu.
Information	Displays information about this software connection.
Full screen	Change window to match Sniffer screen size.
Refresh	Request for entire screen update.
Resume/ Suspend	Start and stop screen updates.
Quit	End this Sniffer connection.

Figure 22. Panel buttons on the central console options menu.

To choose an option indicated by a panel button label, move the pointer to the panel button, and click the left mouse button.

Clicking the **information** panel button displays SniffMaster I system information (see Figure 23 below).



```
SniffMaster I (tm): LAB_END

SniffMaster I version 0.9.9a Beta
Copyright 1990, Network General Corporation.

Display dimensions are 80 x 25
Messages:  15 outgoing, 62 incoming (0 errors)

Remote name = LAB_END
Remote host = athens
Port number = 3208
Configuration File = /etc/rsniff.config
Alarm level = 0
```

```
Remote screen is:          Enabled

Print to file:
```

Figure 23. SnifffMaster I system information box.

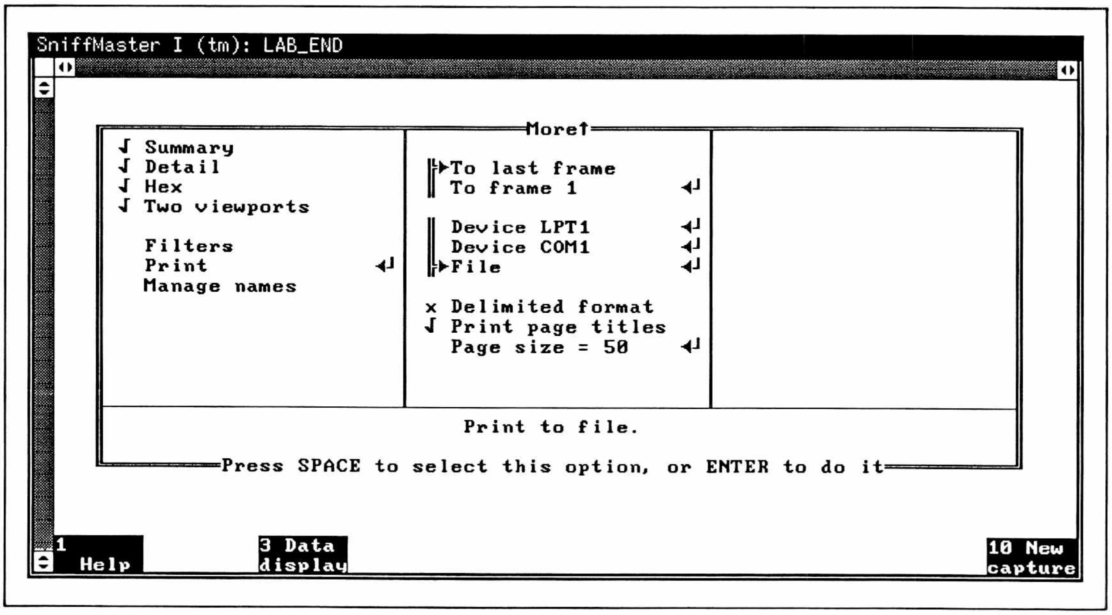
Printing to a file

The third method of making a choice is to enter the required information directly into a field when you want to print to a file. In Figure 20, look at the item, **Print to file:**, just above the panel buttons.

Menu Item	Format	Purpose
Print to file	/directory/file name	Transfers a printable trace file from a remote analyzer to the central console. Remember to configure remote analyzer to redirect output and to set the Display/Print submenu.

Figure 24. Print to file option available on the SniffMaster I central console options menu.

To print to a file, you must first configure the remote analyzer to redirect output to a file. You do that on the Sniffer **display/print** submenu (see Figure 25). Then use the field at the bottom of the central console options menu to enter the directory and the name of the file to which you want to print. Press **Return** to complete the operation.



```
SniffMaster I (tm): LAB_END

                               More↑
√ Summary
√ Detail                 ▸To last frame
√ Hex                     To frame 1           ↵
√ Two viewports
                          Device LPT1          ↵
  Filters                 Device COM1          ↵
  Print              ↵   ▸File                 ↵
  Manage names
                        x Delimited format
                        √ Print page titles
                          Page size = 50       ↵

                        Print to file.
        Press SPACE to select this option, or ENTER to do it
```

Figure 25. Sniffer display/print submenu.

Sniffer Features Unique to SniffMaster I

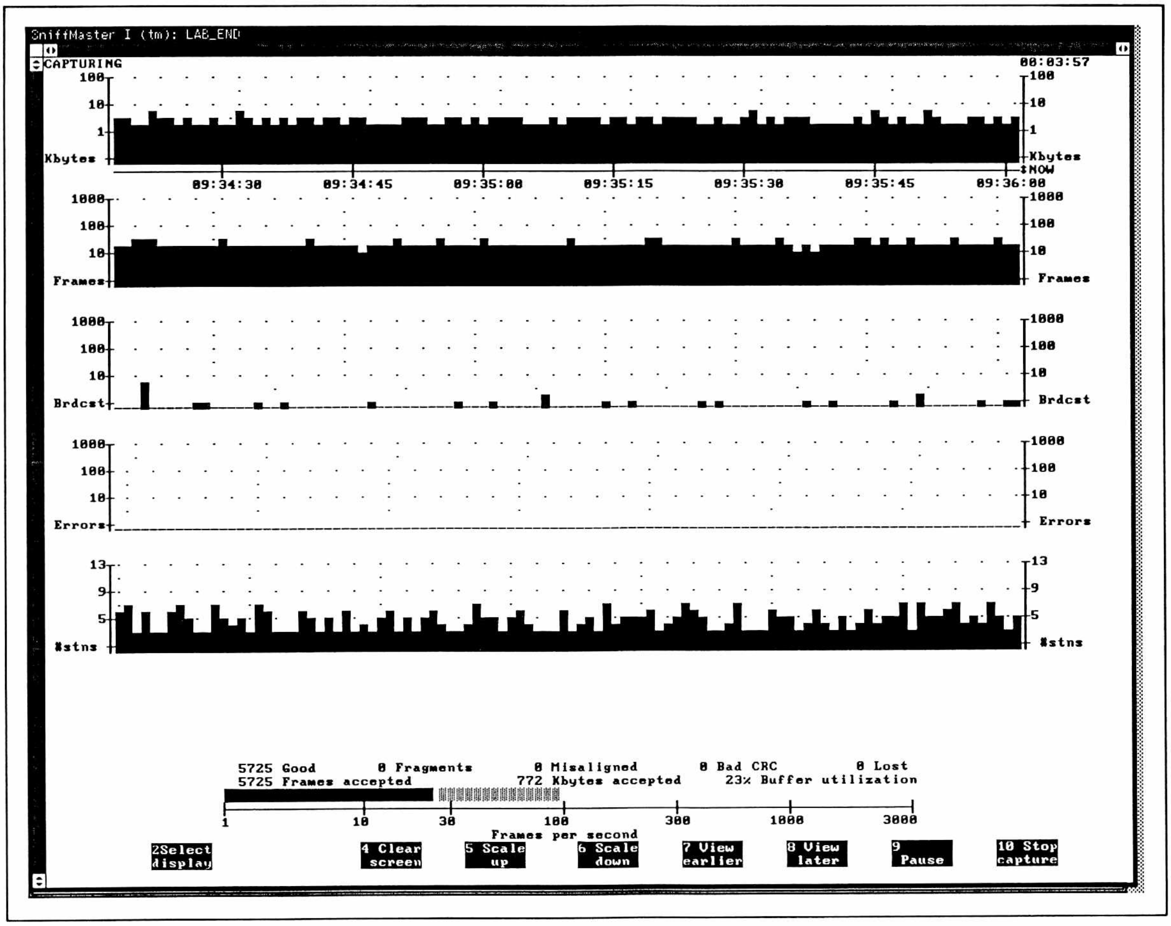
With large monitor on the central console and the addition of a mouse, several other features have been implemented for the Sniffer analyzer.

Five skylines histograms

If you select the **skylines** option for the real-time display in the **capture/skylines** submenu, you see five histograms representing five different types of network information (see Figure 26):

Kbytes	Shows the number of kilobytes being captured with a time interval and with unit sizes that you set.

frames	Shows the number of frames being captured within a time interval and with unit sizes that you specify.
Brdcst	Shows the number of broadcast frames.
errors	Shows the number of frames with errors.
#stns	Shows the number of stations active, i.e., stations that have sent frames in the given interval and in selected unit sizes.



```
5725 Good          0 Fragments        0 Misaligned       0 Bad CRC          0 Lost
5725 Frames accepted            772 Kbytes accepted    23% Buffer utilization
```

Figure 26. Real-time capture display showing five histograms visible with the SniffMaster I system.

More network information visible in Sniffer screen

When you use the SniffMaster I central console options menu, your choice of remote analyzer screen size and font size affects how much network information is actually visible on the screen. For example, if you choose the normal font size with 120 columns and 60 rows in a **summary view**, you will see 55 summary lines that extend the width of the screen, if they have that much information.

Clickable function key buttons

The function keys on any Sniffer screen are clickable with the mouse. To "push" the function key button, move the pointer into the frame with the Sniffer screen you are interested in. Click the function key button with the left mouse button.

Using special keys and key sequences on the Sun keyboard

You will use some special keys on the Sun keyboard that do not exist on the standard PC keyboard. Also some of the key sequences differ from a standard Sniffer analyzer.

◆ Spacebar	The *diamond* keys (also known as *Meta* keys in SunView terminology) serve the same purpose as the **Alt** key on the PC keyboard. You use a diamond key in combination with some other key. For example, to change all the options in a Sniffer submenu list from all checks to all x's (or vice versa), you press **Alt Spacebar**. To perform the same operation from a central console, you press **◆ Spacebar**.
Esc Esc	The equivalent of the **Esc** key on the remote analyzer is to press the **Esc** key on the central console twice.
Help	Redraws the screen on the central console.
+ Help +	Reboots the remote analyzer from the central console.

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Network General Corporation
4200 Bohannon Drive
Menlo Park, CA 94025